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ASSOCIATIONS BETWEEN ABNORMAL INFRAPATELLAR FAT PAD QUALITY AND KNEE OSTEOARTHRITIC CHANGES IN OLDER ADULTS: A COHORT STUDY

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Purpose: There have been no clinical and epidemiological studies reporting the association between infrapatellar fat pad abnormal changes and knee osteoarthritis measures so the role of infrapatellar fat pad quality in knee osteoarthritis is unclear. Aim of this study was to determine the cross-sectional and longitudinal associations between abnormal infrapatellar fat pad quality and knee osteoarthritic changes in older adults.
Methods: A total of 971 subjects (mean 62.4 years, 50.1% female) selected randomly from local community were studied. Radiographic knee osteophyte and joint space narrowing (JSN) were assessed using the OARSI atlas. T1- or T2-weighted fat suppressed magnetic resonance imaging (MRI) was utilized to assess infrapatellar fat pad quality (signal intensity change and soft tissue thickening), cartilage volume, cartilage defects, and bone marrow lesions (BMLs). Knee pain was assessed by self-administered Western Ontario McMaster Osteoarthritis Index (WOMAC) questionnaire.
Results: In cross-sectional analyses, both signal intensity change and soft tissue thickening were significantly and positively associated with knee osteophytes, cartilage defects, bone marrow lesions, and knee pain and stiffness, while negatively associated with patellar cartilage volume after adjustment for potential confounders. Soft tissue thickening was also significantly and positively associated with knee joint space narrowing and dysfunction. Longitudinally, signal intensity change was significantly and positively associated with increases in cartilage defects [OR: 1.46, 95% CI: 1.13–1.90 (medial tibiofemoral); OR: 1.45, 95% CI: 1.12–1.87 (lateral tibiofemoral)], bone marrow lesions [OR: 1.44, 95% CI: 1.05–1.99 (medial tibiofemoral); OR: 1.77, 95% CI: 1.31–2.40 (lateral tibiofemoral)], and keen pain when going up/down stairs (OR: 1.27, 95% CI: 1.01–1.59), whereas negatively associated with per annum change in lateral tibial cartilage volume (β: −15.4 mm3, 95% CI: −29.2, −1.7). Consistently, soft tissue thickening was significantly and positively associated with increases in cartilage defects [OR: 1.56, 95% CI: 1.18–2.06 (medial tibiofemoral); OR: 1.50, 95% CI: 1.14–1.98 (lateral tibiofemoral)], bone marrow lesions [OR: 1.82, 95% CI: 1.29–2.58 (medial tibiofemoral); OR: 1.65, 95% CI: 1.19–2.27 (lateral tibiofemoral)], keen pain when walking on flat surface (OR: 1.57, 95% CI: 1.14–2.16), going up/down stairs (OR: 1.56, 95% CI: 1.19–2.04), standing (OR: 1.48, 95% CI: 1.08–2.03), and knee dysfunction (OR: 1.27, 95% CI: 1.00–1.61), but negatively associated with per annum change in lateral tibial cartilage volume (β: −16.8 mm3, 95% CI: −31.8, −1.8).
Conclusions: Signal intensity change and soft tissue thickening within infrapatellar fat pad were associated with clinical and structural abnormalities of knee joint cross-sectionally and over 2.6 years in older adults. These suggest that abnormal infrapatellar fat pad quality may have a detrimental role in the development or progression of knee osteoarthritis.

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COMORBIDITIES ASSOCIATED WITH END-STAGE KNEE OSTEOARTHRITIS EXPLAIN DIFFERENCES IN THE PROBABILITY OF MAJOR COMPLICATIONS WITHIN 30 DAYS OF JOINT ARTHROPLASTY WHEN COMPARED TO PATIENTS WITH HIP OSTEOARTHRITIS

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Purpose: Differences in the incidence of several major early post-operative complications have been reported following hip and knee arthroplasty procedures for osteoarthritis (OA). However, given the postulated different pathogenesis and comorbidities associated with OA of these joints, the relative contributions of these comorbidities to the observed complications, as compared to the surgical procedure itself, are unclear. Thus, the purpose of the present study was to investigate whether comorbidities known to be associated with end-stage knee OA explained differences in the risk of major complications within 30 days of arthroplasty surgery between patients undergoing surgery for knee and hip OA.
Methods: All patients who underwent primary total knee (TKA) or hip arthroplasty (THA) for a diagnosis of OA were extracted from the 2010 to 2012 American College of Surgeons National Surgical Quality Improvement Project databases. Combined, these databases include preoperative risk factor and 30 day postoperative morbidity data from 374 clinical sites in North America, abstracted by trained reviewers. The study cohort encompassed 54,022 cases, including 33,906 of knee OA and 20,116 of hip OA. Patient data extracted included age, gender, and body mass index (BMI) stratified by World Health Organization (WHO) class. In a previous study, the following comorbidities were identified to be independently associated with end-stage knee OA: hypertension requiring medication, diabetes, and higher grade of obesity. Additionally, other variables known to be associated with the risk of one or more complications of interest were extracted, including smoking status within one year of surgery, chronic systemic steroid use within 30 days of surgery, and length of surgery. The specific major complications evaluated were any surgical site infection (SSI), pulmonary embolism (PE), myocardial infarction (MI) and deep vein thrombosis (DVT). Descriptive statistics were obtained. Logistic regression analyses were performed to assess the odds of developing any major complication, as well each major complication individually, between patients with end-stage knee and hip OA undergoing surgery adjusting for demographics and identified comorbidities.
Results: Significantly greater odds of developing a major complication were observed in patients with knee OA as compared to those with hip OA when controlled for age and gender alone (OR: 1.22; 95%CI [1.08–1.37]). However, after controlling for associated comorbidities and other risk factors, knee arthroplasty itself was not associated with significantly different odds of experiencing a major complication (1.13; 95% CI [0.99–1.27]). Increasing obesity was associated with increased odds of SSI (grade III vs normal OR 2.40; 95% CI [1.66–3.47]) and PE (OR 2.51; 95%CI [1.32–4.79]). Diabetes was associated with increased odds of SSI (OR 1.46; 95%CI [1.18–1.80]) and MI (OR 1.98; 95% CI [1.36–2.88]). Hypertension was associated with increased odds of MI (OR 2.33; 95% CI [1.44–3.76]). None of the studied comorbidities were found to independently predict differences in the odds of DVT.
Conclusions: The results of the present study suggest that the relative probabilities of developing early post-operative major complications following knee and hip arthroplasty for OA are significantly influenced by patients' comorbidities. Given the increased prevalence of important predictors such as obesity, diabetes and hypertension among patients with end-stage knee OA, some of the probability of developing complications following knee arthroplasty may be incorrectly attributed to the procedure itself, rather than to differences in patient characteristics when compared to those undergoing hip arthroplasty.

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THE RELATIONSHIP BETWEEN PRE-OPERATIVE 'TIMED GET UP AND GO' AND LENGTH OF STAY IN PRIMARY ELECTIVE HIP AND KNEE ARTHROPLASTY PATIENTS

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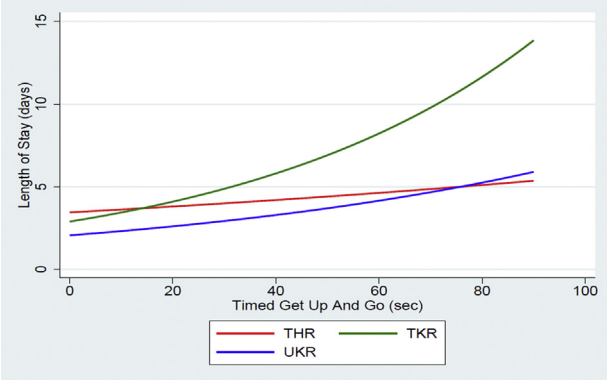
Purpose: To test whether a relationship exists between length of stay (LoS) and the 'timed get up and go' test (TUG), an easily administered and validated functional measure, within the Clinical Outcomes in Arthroplasty Study (COASt) cohort.
The number of patients undergoing lower limb arthroplasty is continuing to rise. The increasing number of elective surgery patients will demand an increasing share of hospital beds. Clinical tools that could predict hospital LoS may help identify modifiable risk factors that could influence patient outcomes as well as costs.
Methods: Patients presenting with symptomatic end-stage osteoarthritis causing pain or reduced function who elected for surgery were considered for this study. Participants included 534 elective primary lower limb arthroplasty patients; 236 total hip (THR), 161 total knee (TKR) and 137 uni-compartmental knee replacement (UKR) attending

the Nuffield Orthopaedic Centre (Oxford) between 2010–2012. LoS data was highly skewed and underwent natural log transformation. Linear regression methods were used to assess the association between TUG and LoS after adjustment for age, gender and BMI. To assess whether the association between preoperative TUG and postoperative LoS was consistent across operation type an interaction between these two variables was also included.

Table 1
Mean values of baseline characteristics in sample population ($n = 534$).

Variable	Value
Female *n* (%)	290 (54%)
Male *n* (%)	244 (46%)
Age (years)	67.5
Male BMI (kg/m^2)	28.8
Female BMI (kg/m^2)	29.9
Median LoS TKR (days)	4
Median LoS THR (days)	4
Median LoS UKR (days)	2

Results: Median length of stay differed significantly (unadjusted $p < 0.001$) according to operation type (Table 1). TKR patients were significantly older (mean 3 years $p = 0.04$) than THR or UKR patients, which may explain longer LoS. After adjustment for confounding factors, there was a significant association between LoS and TUG (Graph 1) which differed by operation type ($p = 0.04$). A 10 second increase in TUG predicted a 19% increase in LoS for TKR patients ($p < 0.001$), a 12.4% increase in UKR patients ($p = 0.004$) and a non-significant 5% increase in THR patients ($p = 0.125$).



Graph 1: The association between length of stay (days) and the timed up and go test (seconds) in total hip (THR), total knee (TKR) and uni-compartmental knee replacement (UKR) patients.

Conclusions: A significant association between TUG and LoS was demonstrated for knee replacement patients. These findings suggest that use of tools such as TUG may be a quick and simple method to enable clinicians and commissioners to plan for resource usage. Consequently, this may have implications on patient care pathways as well as financial significance.

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DO PSYCHOLOGICAL FACTORS PREDICT RESPONSE TO INTRA-ARTICULAR STEROID THERAPY IN KNEE OSTEOARTHRITIS?

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Purpose: Intra-articular steroid therapy is widely used in clinical practice in the management of knee osteoarthritis (OA) and included in current management guidelines for the disease. There is a paucity of data, however, about the influence of psychological factors on treatment response. Such data are important and may help better targeting of therapy. The aim of this analysis was to determine whether levels of anxiety and depression at baseline influence response to intra-articular steroid therapy in patients with symptomatic knee OA.
Methods: Men and women aged 40 years and older with painful knee OA, and who met American College of Rheumatology (ACR) criteria for the disease, were recruited for participation in an ongoing open-label clinical trial of intra-articular steroid therapy. Subjects who took part in the study had significant knee pain and had grade 2 (Kellgren-Lawrence) or higher knee OA. At baseline they completed questionnaires about their symptoms including the Knee Injury and Osteoarthritis Outcome Score (KOOS) (0-100), with lower scores indicating greater pain and also a VAS (0–10) for pain during a nominated activity (VASnA), with higher scores indicating greater pain. They also completed the Hospital Anxiety and Depression (HAD) Scale, a 14-item scale which includes items relating to anxiety and depression both ranging in total from 0 (none) to 21 (maximum). They subsequently had an intra-articular steroid injection with repeat pain assessments at the follow-up visit usually within a 2 week period. We used linear regression to look whether pre-intervention anxiety and depression scores were associated with change in pain. We also used between-groups t-tests to investigate whether these scores differed between responders and non-responders (according to OARSI-OMERACT criteria).
Results: Eighty-eight patients, mean age 61.2 yrs (SD = 10.2 yrs), of whom 48 (54.6%) were female, were studied. The median time between the baseline and follow-up assessment was 8 days (inter-quartile range 7–13 days). There was an increase in KOOS score between baseline and follow-up (25.2 points; 95% Confidence Interval [CI] 20.5–30.0 points; $p < 0.001$) and a reduction in VASnA (−3.3 cm; 95% CI −3.9 to −2.6 cm; $p < 0.001$), both indicating an improvement in pain symptoms following steroid injection. Higher anxiety scores at baseline were associated with less change in pain (following intervention) using KOOS (b coefficient / per unit change in anxiety score = −1.08; 95% CI −2.16 to −0.01; $p = 0.049$). Higher anxiety levels were weakly positively linked with change in pain using VASnA (b coefficient = 0.06; 95% CI −0.09–0.22; $p = 0.44$) though the confidence intervals included zero. Higher depression scores at baseline were not associated with a change in pain using KOOS (b coefficient = −1.07; 95% CI −2.34–0.21; $p = 0.10$) or change in pain using VASnA (b coefficient = 0.04; 95% CI −0.14–0.22; $p = 0.63$). Using the OARSI-OMERACT criteria 62 (70.5%) patients were responders. Those who responded had lower anxiety scores than those who did not respond (mean score = 5.96 vs 7.43; $p = 0.15$) and lower depression scores (mean score = 4.16 vs 4.64; $p = 0.18$); however, these differences were not statistically significant.
Conclusion: Adverse psychological factors, especially anxiety, appear to limit response to intra-articular steroid treatment in patients with symptomatic knee OA.

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GREATER AGE AND BODY MASS INDEX AT BASELINE ARE ASSOCIATED WITH THE ONSET OF RAPID KNEE OSTEOARTHRITIS: DATA FROM THE OSTEOARTHRITIS INITIATIVE

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